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10/025,769	12/26/2001	Hiroyuki Fuse	016907-1349	5852

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EXAMINER	
WORKU, NEGUSSIE	
ART UNIT	**PAPER NUMBER**
2626	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/025,769	**Applicant(s)** FUSE, HIROYUKI	
	Examiner Negussie Worku	**Art Unit** 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 April 2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 April 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Negussie Worku

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/26/01.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasanuma et al. (USP 5,583,644).

With respect to claim 1, Sasanuma et al. discloses an image forming apparatus (an image forming system of fig 1) comprising: a scanning section (a CCD 21 of image reader 202 of fig 3) which reads a document image and outputs image data representing the density of the read image for each pixel, see (col.4, lines 10-15); a pulse width modulating section (PWM 26 of fig 3) which takes in as input the image data output from said scanning section (CCD of the reader 202 of fig 3) and performs a pulse width modulating operation of generating (pulse width modulating operation is performed by 26 of fig 3, col.4, lines 20-25), and outputting a drive signal synchronized for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate, see (col.4, lines 20-30); a laser unit (103 of fig 2) configured to be turned on and off

according to the drive signal (laser drive signal 102 of fig 3) output from said pulse width modulating section and emit a laser beam during each on period (laser drive signal 102 of fig 3, see col.3, lines 35-45); a photosensitive drum (106 of fig 2) a scanning section which linearly scans the surface of said photosensitive drum with the laser beam emitted from said laser unit (103 of fig 2) along the axial direction of the photosensitive drum (106 of fig 2), and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum (106 of fig 2); a control section (control 201 of fig 1, col.4, lines 60-65), which shifts the number of pixels to be used for the pulse width modulating operation of said pulse width modulating section (26 of fig 3) for each linear scanning operation of said scanning section (a CCD 21 of image reader 202 of fig 3); and a correcting section (density converter 42 of fig 5, col.5, lines 1-10) which corrects the image data output from said scanning section (a CCD 21 of image reader 202 of fig 3) and input to said pulse width modulating section (26 of fig 3) according to the input/output characteristics of the pulse width modulating section, see (col.4, lines 20-30).

With respect to claim 2, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said pulse width modulating section (pulse modulation section 26 of fig 3) selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, see (col.4, lines 20-30) a pulse width modulating operation (26 of fig 3) of generating and outputting a drive signal (laser drive

signal 102 of fig 3) with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data, see (col.4, lines 30-35).

With respect to claim 3, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said control section (control 201 of fig 1, col.4, lines 60-65), selects two of the pulse width modulating operation for a single pixel, see (col.4, lines 30-33) the pulse width modulating operation (26 of fig 3) for two pixels and the pulse width modulating operation for three or more than three pixels and causes said pulse width modulating section to carried out the selected two pulse width modulating operations alternately, on a line-by-line basis, for the linear scanning operation of said scanning section (a CCD 21 of image reader 202 of fig 3).

With respect to claim 4, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said correcting section (density converter 42 of fig 5, col.5, lines 1-10) corrects the image data input to the pulse width modulating section (26 of fig 3) so that the drive signal that is output from the pulse width modulating section in response to the corresponding input of image data to the pulse width modulating section may be same as the imaginary output of a pulse width modulating section showing predetermined ideal input/output characteristics (a CCD 21 of image reader 202 of fig 3).

With respect to claim 5, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said correcting section (density converter 42 of fig 5, col.5, lines 1-10), comprises a lookup table (LUT 25 of fig 1) that stores image data input to the correcting section (42 of fig 5) and the corresponding corrected image data that is supposed to be output from the correcting section and input to the pulse width modulating section (26 of fig 2).

With respect to claim 6, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said scanning section (a CCD 21 of image reader 202 of fig 3), a document table (a platen 193 of fig 19), configured to set a document, see (col.8, lines 20-25); an exposure unit (light source 190 of fig 19) configured to expose the document set on said document table (table or platen 193 of fig 19) to light (190 of fig 1); a photoelectric conversion element (CCD 21 of fig 19), configured to receive the image formed by the light reflected from the document table (platen 193 of fig 19) and output an image signal showing a voltage level corresponding to the received image formed by the reflected light (190 of fig 19); an A/D conversion unit (A/D 22 of fig 19) configured to perform A/D conversion on the image signal output from said photoelectric conversion element (21 of fig 19), and output corresponding image data; and an image processing section (195 of fig 19) configured to process the image data output from said A/D conversion unit (22 of fig 19) and output the processed image data, see (col.8, lines 16-25).

With respect to claim 7, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said scanning section (CCD 21 of image sensor 202 of fig 1) has: a document table (platen table 193 of fig 19) configured to set a document (image or original positioned on platen 193 of fig.19); an exposure unit (exposure unit 190 of fig 19) configured to expose the document set on said document table (on platen 193 of fig 19) to light; a photoelectric conversion element (CCD21 of fig reader 202 of fig 1) configured to receive the image formed by the light reflected from the document table (193 of fig 19) and output an image signal showing a voltage level corresponding to the density of the red image, see col.3, lines 27-30), an image signal showing a voltage level corresponding to the density of the green image and an image signal showing a voltage level corresponding to the density of the blue image out of the received image formed by the reflected light, see (col.5, lines 45-49); an A/D conversion unit (A/D 22 of fig 19) configured to perform A/D conversion on each of the image signals output from said photoelectric conversion element and output image data R showing the density of the red image, image data G showing the density of the green image and image data B showing the density of the blue image, see (col.5, lines 45-49, on each color); and an image processing section (CPU 195 of fig 19) configured to process the image data R, G, B (col.5, lines 45-49, on each color); output from said A/D conversion unit (A/D converter 22 of fig 19) and output image data Y showing the density of the yellow image, image data M showing the density of the magentan image, image data C showing the density of the cyan image and image data K showing the density of the

black image (as shown fig 18, see col.5, lines 45-49, on each color).

With respect to claim 8, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said pulse width modulating section (pulse modulation section 26 of fig 3) selectively performs a pulse width modulating operation of generating and outputting a drive signal (laser drive 102 of fig 3) with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, see (col.4, lines 20-25) a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data, see (col.4, lines 10-35).

With respect to claim 9, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said control section (controller 201 of fig 1) selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels, in accordance with which one of the image data Y, M, C, K has been output from said image processing section (CPU 28 of fig 3) and for causing the pulse width modulating section (26 of fig 3) to carried out the selected two pulse width modulating operations alternately on a line-by-line basis for the linear scanning operation of said scanning

section (a CCD 21 of image reader 202 of fig 3).

With respect to claim 10, Sasanuma et al. discloses an image forming apparatus (fig 1-4), comprising: a scanning means (a CCD 21 of image reader 202 of fig 3), for reading a document image and outputting image data representing the density of the read image for each pixel, see (col.3, lines 18-23); a pulse width modulating means (26 of fig 3) for taking in as input the image data output from said scanning means (a CCD 21 of image reader 202 of fig 3), and performing a pulse width modulating operation of generating and outputting a drive signal synchronized for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate, see (col.4, lines 30-35); a laser unit (laser 103 of fig 2), configured to be turned on and off according to the drive signal output from said pulse width modulating means (26 of fig 1) and emit a laser beam during each on period; a photosensitive drum (106 of fig 13 or 1); a scanning means (a CCD 21 of image reader 202 of fig 3), for linearly scanning the surface of said photosensitive drum (106 of fig 1) with the laser beam (03 of fig 2) emitted from said laser unit (103 of fig 2) along the axial direction of the photosensitive drum (113 of fig 2) and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum (106 of fig 1); a control means (controller 201 of fig 1) for shifting the number of pixels to be used for the pulse width modulating operation of said pulse width modulating means (26 of fig 3) for each linear scanning operation of said scanning means (a CCD 21 of image reader 202 of fig 3); and a correcting means (42 of fig 5,

inconjection to table 42a) for correcting the image data output from said scanning means (a CCD 21 of image reader 202 of fig 3), and input to said pulse width modulating means (26 of fig 3) according to the input/output characteristics of the pulse width modulating means, see (col.4, lines 30-25).

With respect to claim 11, Sasanuma et al. discloses the apparatus (fig 1-4) wherein said pulse width modulating means (26 of fig 3) selectively performs a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, see (col.4, lines 15-25) a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating (pulse modulation 26 of fig 3) operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data, see (col.4, lines 10-35).

With respect to claim 12, Sasanuma et al. discloses the apparatus, wherein said control means (controller 201 of fig 1) selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels and causes said pulse width modulating means to carried out the selected two pulse width modulating

operations alternately, on a line-by-line basis, for the linear scanning operation of said scanning means (CCD 21 of image reader 202 of fig 3).

With respect to claim 13, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said correcting means (density converter section 42 of fig 5) corrects the image data input to the pulse width modulating means (26 of fig 3) so that the drive signal that is output from the pulse width modulating means (26 of fig 1) in response to the corresponding input of image data to the pulse width modulating means may be same as the imaginary output of a pulse width modulating means showing predetermined ideal input/output characteristics, see (col.4, lines 15-35).

With respect to claim 14, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said correcting means (density converter 42 of fig 5) comprises a lookup table (25 of fig 1), that stores image data input to the correcting means (42 of fig 5) and the corresponding corrected image data that is supposed to be output from the correcting means (42 of fig 5) and input to the pulse width modulating means (26 of fig 2, see col.4, lines 20-35).

With respect to claim 15, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said scanning section (a CCD 21 of image reader 202 of fig 3), a document table (a platen 193 of fig 19), configured to set a document, see (col.8, lines 20-25); an exposure unit (light source 190 of fig 19) configured to expose the document set on said

document table (table or platen 193 of fig 19) to light (190 of fig 1); a photoelectric conversion element (CCD 21 of fig 19), configured to receive the image formed by the light reflected from the document table (platen 193 of fig 19) and output an image signal showing a voltage level corresponding to the received image formed by the reflected light (190 of fig 19); an A/D conversion unit (A/D 22 of fig 19) configured to perform A/D conversion on the image signal output from said photoelectric conversion element (21 of fig 19), and output corresponding image data; and an image processing section (195 of fig 19) configured to process the image data output from said A/D conversion unit (22 of fig 19) and output the processed image data, see (col.8, lines 16-25).

With respect to claim 16, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said scanning section (CCD 21 of image sensor 202 of fig 1) has: a document table (platen table 193 of fig 19) configured to set a document (image or original positioned on platen 193 of fig 19); an exposure unit (exposure unit 190 of fig 19) configured to expose the document set on said document table (on platen 193 of fig 19) to light; a photoelectric conversion element (CCD21 of fig reader 202 of fig 1) configured to receive the image formed by the light reflected from the document table (193 of fig 19) and output an image signal showing a voltage level corresponding to the density of the red image, see col.3, lines 27-30), an image signal showing a voltage level corresponding to the density of the green image and an image signal showing a voltage level corresponding to the density of the blue image out of the received image formed by the reflected light, see (col.5, lines 45-49); an A/D conversion unit (A/D 22 of fig 19)

configured to perform A/D conversion on each of the image signals output from said photoelectric conversion element and output image data R showing the density of the red image, image data G showing the density of the green image and image data B showing the density of the blue image, see (col.5, lines 45-49, on each color); and an image processing section (CPU 195 of fig 19) configured to process the image data R, G, B (col.5, lines 45-49, on each color); output from said A/D conversion unit (A/D converter 22 of fig 19) and output image data Y showing the density of the yellow image, image data M showing the density of the magentan image, image data C showing the density of the cyan image and image data K showing the density of the black image (as shown fig 18, see col.5, lines 45-49, on each color).

With respect to claim 17, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said pulse width modulating section (pulse modulation section 26 of fig 3) selectively performs a pulse width modulating operation of generating and outputting a drive signal (laser drive 102 of fig 3) with a pulse width corresponding to the density of a single pixel in synchronism with each of the pixels of the input image data, see (col.4, lines 20-25) a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of two pixels in synchronism with every two of the pixels of the input image data or a pulse width modulating operation of generating and outputting a drive signal with a pulse width corresponding to the density of three or more than three pixels in synchronism with every three or more than three, whichever appropriate, of the pixels of the input image data, see (col.4, lines 10-35).

With respect to claim 18, Sasanuma et al. discloses the apparatus (fig 1-4), wherein said control means (controller 201 of fig 1) selects two of the pulse width modulating operation for a single pixel, the pulse width modulating operation for two pixels and the pulse width modulating operation for three or more than three pixels, in accordance with which one of the image data Y, M, C, K has been output from said image processing means (CPU 28 of fig 3) and for causing the pulse width modulating means (26 of fig 3) to carried out the selected two pulse width modulating operations alternately on a line-by-line basis for the linear scanning operation of said scanning means (a CCD 21 of image reader 202 of fig 3).

With respect to claim 19, Sasanuma et al. discloses a method of controlling an image forming apparatus (fig 1-4), comprising: a scanning section (a CCD 21 of image reader 202 of fig 3), for reading a document image and outputting image data representing the density of the read image for each pixel, see (col.3, lines 18-23); a pulse width modulating section (26 of fig 3) for taking in as input the image data output from said scanning section (a CCD 21 of image reader 202 of fig 3), and performing a pulse width modulating operation of generating and outputting a drive signal synchronized for one or more than one pixel of the image data and having a pulse width corresponding to the density of the one or more than one pixel, whichever appropriate, see (col.4, lines 30-35); a laser unit (laser 103 of fig 2), configured to be turned on and off according to the drive signal output from said pulse width modulating section (26 of

fig 1), and emit a laser beam during each on period; a photosensitive drum (106 of fig 13 or 1); a scanning section (a CCD 21 of image reader 202 of fig 3), for linearly scanning the surface of said photosensitive drum (106 of fig 1) with the laser beam (03 of fig 2) emitted from said laser unit (103 of fig 2) along the axial direction of the photosensitive drum (113 of fig 2) and repeating the linear scanning operation successively in synchronism with the rotation of said photosensitive drum (106 of fig 1); a control section (controller 201 of fig 1) for shifting the number of pixels to be used for the pulse width modulating operation of said pulse width modulating means (26 of fig 3) for each linear scanning operation of said scanning means (a CCD 21 of image reader 202 of fig 3); and a correcting means (42 of fig 5, in-conjection to table 42a) for correcting the image data output from said scanning means (a CCD 21 of image reader 202 of fig 3), and input to said pulse width modulating section (26 of fig 3) according to the input/output characteristics of the pulse width modulating section, see (col.4, lines 30-25).

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Negussie Worku whose telephone number is 571-272-7472. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on 571-272-7471. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Negussie Worku
Art unit 2626
Patent Examiner
July 18, 2005

KAWilliams

KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER